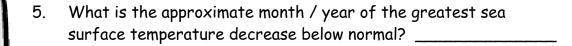## III. Gather Data

A. Comparison of Different El Ninos

- Click on the "El Nino Comparison Graph" site.
- Scroll down to the bottom of the site to see the graph of El Ninos.
- Record the years of El Ninos in the chart below then answer the following questions about the El Ninos.

El Nino Years

19_____   19_____   19_____   19_____   19_____   19_____   19_____

1. Which El Nino year before 1997 was the most severe? 19_____

2. What was the greatest recorded sea surface temperature increase above normal? _____ degrees Celsius

3. What is the approximate month / year of the greatest sea surface temperature increase above normal? _____

4. What was the greatest recorded sea surface decrease below normal? _____ degrees Celsius

5. What is the approximate month / year of the greatest sea surface temperature decrease below normal? _____

6. In what year was El Nino the weakest? 19____

7. During the period around June on the left side of the graph, what was the difference in temperatures between the 1986 El Nino and the 1997 El Nino? _____ degrees Celsius

- Click "Back" until you get back to the OAR El Nino Activity.

B. Comparison of Western Pacific Rainfall during El Ninos.

- Click on the "Rainfall" site.
- Scroll down to the "Select a Graph Type" box.
- Choose "graph total precipitation each year for a period of years."
- Scroll down to the world map.

Western Pacific 1 - Rockhampton, Australia
- Click on the picture of Australia.
- In the box that appears, click on Australia if it is not highlighted.
- Click "Okay".
- At the "Select a station" page, scroll down and click on Rockhampton Airport.
- Scroll down to the "Select the type of units you prefer" section.
- Click metric units.
- Scroll down to the "Select a Time Period to Graph" section.
- You can use the tab key to move to the next box without scrolling.
- Enter the years 1955 and 1988 in the boxes.
- Click "Graph Data".
- Answer the following questions about Rockhampton airport.
<u>Keep in mind the effects of an El Nino on the western Pacific.</u>

1. Record the latitude and longitude of Rockhampton in the chart under question 2 below.

2. What are the rainfall amounts for Rockhampton in the El Nino years? Fill in the rainfall amounts below the years.
   Each horizontal line represents about 4 cm of rainfall.

Rockhampton, Australia

Latitude = S		Longitude = E		
1957	1965	1972	1982	1986

3. When are the lowest annual precipitations shown?

   19 _____ and 19 _____

4. What two back-to-back years show the greatest increase in rainfall from year to year? _____

- To get to the stations (city) directory to get information about Melbourne Australia's rainfall, click "Back" once.

- To leave the western Pacific and go to the eastern Pacific (U.S. and South American) cities, click "Back" three times to get to the map menu. Skip the rest of section B and go directly to section C.

- To continue with the western pacific, answer the questions beginning on the next page.

Western Pacific 2 - Melbourne, Australia

- From the stations menu, scroll down and select Melbourne.
- Scroll down to the "Select the type of units you prefer" section.
- Click metric units.
- Click "Graph Data".
- Answer the following questions about the graphed data.

Keep in mind the effects of an El Nino on the western Pacific.

1.   Record the latitude and longitude of Melbourne in the chart under question 2 below.

2.   What are the rainfall amounts for Melbourne in the El Nino years? Fill in the rainfall amounts below the years.
   Each horizontal line represents about 2 cm of rainfall.

Melbourne, Australia				
Latitude = S Longitude = E				
1957	1966	1972	1982	1986

3.   What was the most severe El Nino year in Melbourne? 19 _____

4.   What was the rainfall total for the most severe El Nino year in Melbourne? _____ centimeters

5.   What was the least severe El Nino year in Melbourne? 19 ____

6.   What two back-to-back years show the greatest decrease in rainfall from year to year? _____

- Click "Back" twice to get to the country menu.

Western Pacific 3 - Kota Kinabalu, Malaysia

- Select Malaysia.
- Click "Okay".
- At the "Select a station" page, select Kota Kinabalu.
- Scroll down to the "Select the type of units you prefer" section.
- Click metric units.
- Scroll or tab down to the "Select a Time Period to Graph" section.
- Enter the years 1955 and 1988 in the boxes.
- Click "Graph Data".
- Answer the following questions.

<u>Keep in mind the effects of an El Nino on the western Pacific.</u>

1. Record the latitude and longitude of Kota Kinabalu in the chart under question 2 below.

2. What are the rainfall amounts for Kota Kinabalu in the El Nino years? Fill in the rainfall amounts below the years.
Each horizontal line represents about 7.5 cm of rainfall

Kota Kinabalu, Malaysia				
Latitude = N			Longitude = E	
1957	1965	1972	1982	1987

3. What was the most severe El Nino year in Kota Kinabalu? 19 ____

4. What was the rainfall total for the most severe El Nino year in Kota Kinabalu? _____ centimeters

5. What were the least severe El Nino years in Kota Kinabalu? 19 ____ 19 ____

6. What was the increase in rainfall from 1972 to 1973? _____centimeters

- Click "Back" three times to get to the map menu.

C. Comparison of eastern Pacific Rainfall during El Ninos.

Eastern Pacific 1 - La Serina, Chile
- Click on western South America.
- At the country menu, select Chile.
- Click "Okay".
- At the "Select a station" page, select La Serina.
- Scroll down to the Select the type of unit" section.
- Click metric units.
- Scroll or tab down to the "Select a Time Period to Graph" section.
- Enter the years 1955 and 1988 in the boxes.
- Click "Graph Data".

1. Record the latitude and longitude of La Serina in the chart under question 2 below.

2. What are the rainfall amounts for La Serina in the El Nino years? Fill in the rainfall amounts below the years.
   Each horizontal line represents about 0.7 cm of rainfall.

La Serina, Chile				
Latitude = S			Longitude = W	
1957	1965	1972	1983	1986/87

- Answer the following questions.
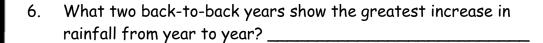 Keep in mind the effects of an El Nino on the eastern Pacific.
3. What was the most severe El Nino year in La Serina?   19 _____

4. What was the rainfall total for the most severe El Nino year in La Serina? _____ centimeters

5.	What was the least severe El Nino year in La Serina? 19_____

6.	What two back-to-back years show the greatest increase in rainfall from year to year? _____

- To continue investigating the eastern Pacific, click "Back" three times to return to the map menu. Go to the "Eastern Pacific 2" section below.

- To skip the eastern Pacific and go on to the next section, click "Back" until you get back to the OAR El Nino site, or click OAR site under favorites or bookmarks.

Eastern Pacific 2 - Santa Cruz, California, USA
- Click on the United States.
- At the "Select a country" page, click "Okay".
- At the "Select a State" page, select California.
- Click "Okay".
- At the "Select a station" page, select Santa Cruz.
- Scroll down to the Select the type of unit" section.
- Click metric units.
- Scroll or tab down to the "Select a Time Period to Graph" section.
- Enter the years 1955 and 1988 in the boxes.
- Click "Graph Data".

- Answer the following questions.
Keep in mind the effects of an El Nino on the eastern Pacific.

1.	Record the latitude and longitude of Santa Cruz in the chart under question 2 below.

2.	What are the rainfall amounts for Santa Cruz in the El Nino years? Fill in the rainfall amounts below the years.
	Each horizontal line represents about 3.5 cm of rainfall.

Santa Cruz, USA				
Latitude = N			Longitude = W	
1957	1966	1973	1983	1986

3.   What was the most severe El Nino year in Santa Cruz? 19_____

4.   What was the rainfall total for the most severe El Nino year in Santa Cruz? _____ centimeters

5.   What was the least severe El Nino year in Santa Cruz? 19_____

6.   What two back-to-back years show the greatest increase in rainfall from year to year?

_____

- Click "Back" once to return to the stations menu.

Eastern Pacific 3 - Los Angeles International Airport, California, USA

-   Select Los Angeles Int.
-   Click "Graph Data".
- Answer the following questions. Keep in mind the effects of an El Nino on areas of the eastern Pacific.

1.   Record the latitude and longitude of Los Angeles Internat'l Airport in the chart under question 2 below.

2. What are the rainfall amounts for Los Angeles in the El Nino years? Fill in the rainfall amounts below the years.
    Each horizontal line represents about 1.6 cm of rainfall.

Los Angeles, USA				
Latitude =		N	Longitude =	W
1957	1965	1973	1983	1986

3. What was the most severe El Nino year in Los Angeles? 19____

4. What was the rainfall total for the most severe El Nino year in Los Angeles? _____ centimeters

5. What was the least severe El Nino year in Los Angeles? 19_____

6. What two back-to-back years show the greatest increase in rainfall from year to year? _____

- Click "Back" 5 times until you get back to the OAR El Nino Activity or choose OAR Site from the "Favorites" or "Bookmarks" menu at the top of the screen.